GasAlertMicro

H_2S, CO, O_2 , Combustibles

2, 3 and 4 Gas Detectors

User Manual

BW Technologies

Limited Warranty & Limitation of Liability

BW Technologies Ltd. (BW) warrants this product to be free from defects in material and workmanship under normal use and service for a period of two years, beginning on the date of shipment to the buyer. This warranty extends only to the sale of new and unused products to the original buyer. BW's warranty obligation is limited, at BW's option, to refund of the purchase price, repair, or replacement of a defective product that is returned to a BW authorized service center within the warranty period. In no event shall BW's liability hereunder exceed the purchase price actually paid by the buyer for the Product.

This warranty does not include:

a) fuses, disposable batteries or the routine replacement of parts due to the normal wear and tear of the product arising from use;
b) any product which in BW's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation, handling or use;
c) any damage or defects attributable to repair of the product by any person other than an authorized dealer, or the installation of unapproved parts on the product; or

The obligations set forth in this warranty are conditional on:

a) proper storage, installation, calibration, use, maintenance and compliance with the product manual instructions and any other applicable recommendations of BW;
b) the buyer promptly notifying BW of any defect and, if required, promptly making the product available for correction. No goods shall be returned to BW until receipt by the buyer of shipping instructions from BW; and
c) the right of BW to require that the buyer provide proof of purchase such as the original invoice, bill of sale or packing slip to establish that the product is within the warranty period.

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CAUTION: FOR SAFETY REASONS, THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

GasAlertMicro Gas Detector

Order Number	Description
GAMIC-4	GasAlertMicro (4 Gas) Detector (H_2S, CO, O_2, *Combustibles)
GAMIC-3H	GasAlertMicro (3 Gas) Detector (H_2S, O_2, *Combustibles)
GAMIC-2	GasAlertMicro (2 Gas) Detector (O_2, *Combustibles)
GAMIC-4-DL2	GasAlertMicro (4 Gas) c/w User Downloadable Datalogger
GAMIC-3H-DL2	GasAlertMicro (3 Gas) c/w User Downloadable Datalogger
GAMIC-2-DL2	GasAlertMicro (2 Gas) c/w User Downloadable Datalogger

* Combustibles: Field-selectable for 0-100% LEL (lower explosive limit) or 0-5.0% methane v/v

GasAlertMicro Multi-Gas Detector

Standard instrument is equipped with integral concussion-proof boot and internal vibrator alarm.

GasAlertMicro with User Downloadable Datalogger

Provides full time continuous datalogging while the instrument is operating. Data is saved on a convenient MultiMediaCard and can be removed and downloaded by the user. Data is imported into standard office software (Microsoft® Excel, Access etc.). Wraparound memory ensures the most recent data is always saved.

GasAlertMicro

Introduction

⚠ Warning

To ensure your personal safety, read "Safety Information" before you use the detector.

The GasAlertMicro gas detector ("the detector") warns of hazardous gas at levels above user-selectable alarm setpoints. This product is a gas detector.

The detector is a personal safety device. It is your responsibility to respond properly to the alarm.

Table 1 lists the gases monitored.

Table 1. Gases Monitored

Gas Detected	Unit of Measure
Hydrogen Sulfide (H_2S)	parts per million (ppm)
Carbon Monoxide (CO)	parts per million (ppm)
Oxygen (O_2)	percent by volume (%)
Combustible Gases Field selectable for:	a) percent of lower explosive limit (% LEL) b) percent by volume methane 0-5.0% v/v

Contacting BW Technologies

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Calgary, AB T2A 7X9
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Or visit us on the World Wide Web: **www.gasmonitors.com**

ISO 9001

Safety Information - Read First

Use the detector only as specified in this manual, otherwise the protection provided by the detector may be impaired.

International symbols used on the detector and in this manual are explained in Table 2.

Read the **Warnings** and **Cautions** on the following pages before using the detector.

Note

This instrument contains batteries. Do not mix with the solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler.

⚠ Cautions

⇒ ***Warning:*** **Substitution of components may impair Intrinsic Safety.**

⇒ **Do not use the detector if it is damaged. Before you use the detector, inspect the case. Look for cracks or missing parts.**

⇒ **If the detector is damaged or something is missing, contact BW Technologies immediately (see p. 2).**

⇒ **Make sure the battery holder is locked in place before you operate the detector.**

⇒ **Use only a sensor specifically designed for your GasAlertMicro model. (See the section "Replacement Parts and Accessories.")**

⇒ **Calibrate the detector before first-time use and then on a regular schedule, depending on use and sensor exposure to poisons and contaminants. BW recommends at least once every 180 days (6 months).**

⇒ **It is recommended that a "bump test" be performed before each day's use to verify proper instrument operation. Calibrate if the readings are not within the specified limits.**

⇒ **Periodically "bump test" the sensors to confirm their ability to respond to gas by exposing the detector to a targeted gas concentration that exceeds the high alarm setpoints. Manually verify that the audible and visual alarms are activated.**

⇒ **It is recommended that the combustible sensor be checked with a known concentration of calibration gas after any known exposure to catalyst contaminants/poisons (sulfur compounds, silicon vapors, halogenated compounds, etc.).**

⚠ Cautions (cont.)

- ⇒ **The combustible sensor is factory calibrated to 50% LEL methane. If monitoring a different combustible gas in the % LEL range, calibrate the sensor using the appropriate gas. High off-scale % LEL or % v/v methane readings may indicate an explosive concentration.**
- ⇒ **Protect the combustible sensor from exposure to lead compounds, silicones and chlorinated hydrocarbons. Although certain organic vapors (such as leaded gasoline and halogenated hydrocarbons) may temporarily inhibit sensor performance, in most cases, the sensor will recover after calibration.**
- ⇒ **Any rapid up-scaling reading followed by a declining or erratic reading may indicate a gas concentration beyond upper scale limit, which may be hazardous.**
- ⇒ **Use only recommended AA alkaline or NiMH batteries properly charged, and installed in the detector case. (See the section "Replacement Parts and Accessories.")**
- ⇒ **Charge NiMH batteries using recommended charger only. Do not use any other charger. Failure to observe this precaution could lead to fire or explosion.**
- ⇒ **Do not change or charge batteries in a hazardous location. Doing so will impair the Intrinsic Safety of the unit and may lead to fire or explosion.**
- ⇒ **Read and observe all instructions and precautions in the literature provided with the charger. Failure to do so may result in fire, electric shock or other forms of personal injury or property damage.**

⚠ Cautions (cont.)

- ⇒ **Extended exposure of the GasAlertMicro to certain concentrations of combustible gases and air may stress a detector element, which can seriously affect its performance. If an alarm occurs due to high concentration of combustible gases, recalibration should be performed, or if needed, the sensor replaced.**
- ⇒ **Do not test the combustible sensor's response with a butane cigarette lighter; doing so will damage the sensor.**
- ⇒ **Do not expose the detector to electrical shock and/or severe continuous mechanical shock.**
- ⇒ **Do not attempt to disassemble, adjust or service the detector unless instructions for that procedure are contained in the manual and/or that part is listed as a replacement part. Use only BW Technologies replacement parts.**
- ⇒ **Do not immerse the detector in liquids.**
- ⇒ **The detector Warranty will be voided if customer personnel or third parties damage the detector during repair attempts. Non-BW Technologies repair/service attempts void this Warranty.**

Table 2. International Symbols

Symbol	Meaning
C SP US	Approved to both U.S. and Canadian Standards by the Canadian Standards Association.
Ex	European Explosion Protection
CE	Conforms to European Union directives
BAM	BAM performance verification and expert opinion (in progress)
ATEX	Conforms to European Directive 94/9/EC – ATEX 95
AUS	Certified to Australian standards (in progress)

Getting Started

The items listed below are included with your detector. If the detector is damaged or something is missing, contact the place of purchase immediately.

- Batteries (2 replaceable alkaline cells)
- O_2 sensor
- Combustible sensor
- 4-gas units: H_2S/CO sensor (dual sensor)
- 3-gas units: applicable toxic sensor
- Calibration hose and cap
- Instructions

To order replacement parts, see the section “Replacement Parts and Accessories.”

The detector comes with sensors installed. The “Maintenance” section describes how to install the batteries.

To become familiar with the features and functions of the detector, study the following figures and tables:

- Figure 1 and Table 3 describe the detector’s components.
- Figure 2 and Table 4 describe the detector’s display elements.
- Table 5 describes the detector’s pushbuttons.

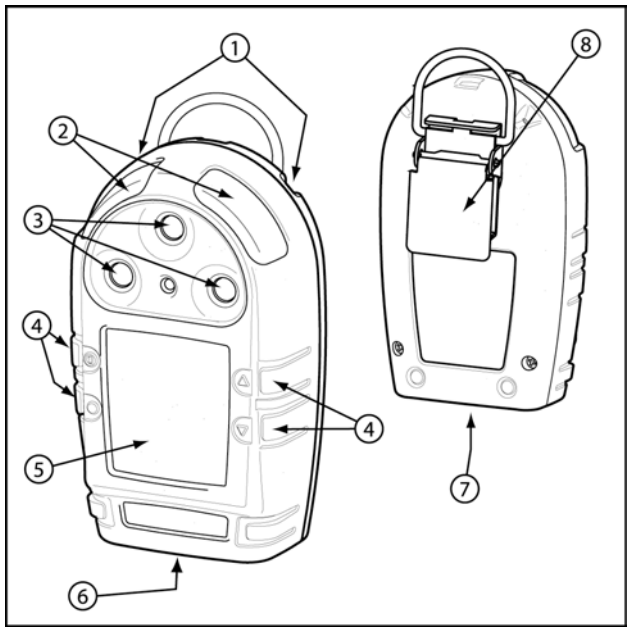


Figure 1. GasAlertMicro Detector

Table 3. GasAlertMicro Detector

Item	Function
①	Audible Alarm
②	Visual Alarm Bars
③	Sensors
④	Pushbuttons
⑤	Display
⑥	Battery Holder
⑦	Datalogger (optional)
⑧	Alligator Clip

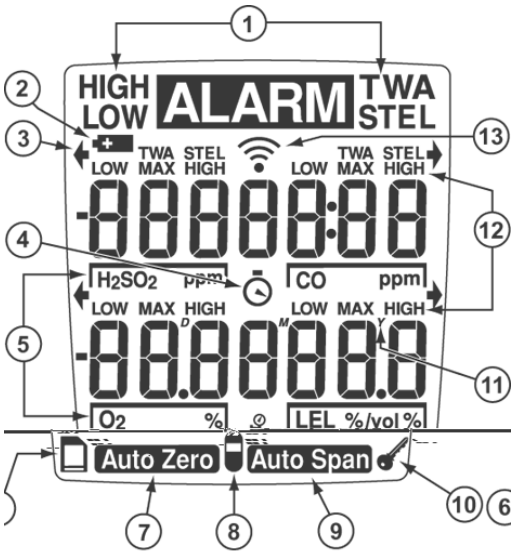


Figure 2. Display Elements

Note: *The display backlight automatically activates for 10 seconds whenever there is insufficient light to view the display and during alarm conditions. Any pushbutton reactivates the backlight in low-light conditions.*

Table 4. Display Elements

Item	Function
①	Alarm Condition
②	Battery
③	Button Indicator
④	Clock
⑤	Gas Identifier Bars
⑥	Optional Datalogger Card Indicator
⑦	Automatically Zero Sensor
⑧	Gas Cylinder
⑨	Automatically Span Sensor
⑩	Pass Code Lock
⑪	Real Time Calendar (Date, Month, Year)
⑫	Alarm Condition (Low, High TWA, STEL or Multi-gas) or view TWA, STEL and Maximum Gas Exposures
⑬	Future Use

Table 5. Pushbuttons

Pushbutton	Description
ⓘ ON/OFF	• To turn on the detector, press ⓘ. • To turn off the detector, press ⓘ and hold for 5 seconds. • To initiate the confidence beep, press ◯ while pressing ⓘ at startup. • To deactivate the confidence beep, press ◯ while pressing ⓘ when the detector is off.
▲	• To increment the displayed value, press ▲. • To enter the user options menu, press ▲ and ▼ simultaneously and hold for 5 seconds. • To clear the TWA, STEL and maximum gas exposure readings, press ◯ and ▲ simultaneously.
▼	• To decrement the displayed value, press ▼. • To initiate calibration and setting alarm setpoints, press ◯ and ▼ simultaneously and hold for 5 seconds.
◯ OK	• To view the TWA, STEL and maximum (MAX) hold readings, press ◯. • To acknowledge latched alarms, press ◯.

Activating the Detector

⇒ To activate the detector, press ⓘ in a normal atmosphere (20.9% oxygen).

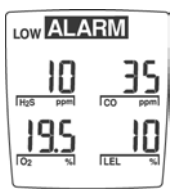
Self-Test

The detector performs the actions in steps 1-9. Manually check that all actions occur.

1. *If battery power is low,* **LOW** *flashes, the display reads* **OFF***. Replace the batteries and restart the detector.*

2. The display shows all elements.
3. The detector beeps and flashes.
4. The detector briefly turns on the backlight.
5. *User Downloadable Datalogger units only:* The display shows the time, day and date.
6. The display shows the TWA, STEL, Low and High Alarm setpoints.

Note: *The alarm setpoints on a shipped detector may vary by region. See "Resetting Gas Alarm Setpoints."*



7. Calibration status is shown.
8. The display reads **tESt** (test) as the detector tests the sensors.
9. The oxygen sensor is calibrated automatically.

If the detector fails steps 1-9, see the section "If the Detector Does Not Work."

Sensor Test

If a sensor fails the self-test, the audible alarm emits a slow modulating tone, the visual alarm flashes slowly and the vibrator alarm activates. The LCD advises which sensor failed.

Calibration Status

Number of days remaining before calibration due is displayed. If calibration is overdue, a warning will sound and the LCD will show the number of days overdue. Press ◯ to acknowledge the warning.

Battery Test

The batteries are tested on activation and continuously after activation. If battery power is low, **LOW** flashes.

Note: *If the Confidence Beep is on, the audible alarm beeps if the batteries have sufficient power and stops if the battery power is low. (See the section "Confidence Beep.")*

Datalogger Operation

Datalogger operation is automatic and requires no settings.

MultiMediaCard icon is displayed continuously in datalogger units when card is present. The card is not required for operation of the User Downloadable Datalogger models. A warning message will display if the card is absent.

Self-Test Pass

If the detector passes the self-test, the detector begins normal operation. The display shows the ambient gas readings:

The detector starts recording the maximum gas exposure and calculating the STEL (short-term exposure level) and TWA (time-weighted average) exposures. If the "SAFE" display is activated, "SAFE" will scroll across the screen.

Self-Test Fail

If the detector fails the self-test, see the section "If the Detector Does Not Work."

Deactivating the Detector

⇒ To turn off the detector, press ⓘ and hold for 5 seconds.

The audible alarm beeps four times, the visual alarm flashes four times and then the display shows:

The display turns off and the detector stops normal operation.

Note: *If ⓘ is held down for less than 5 seconds, the detector will not turn off.*

Confidence Beep

The Confidence Beep tells you the detector is ON and the batteries have sufficient power to respond to a hazardous level of gas and emit an alarm. Instead of beeping when battery power is low, the audible alarm beeps to advise you the batteries have sufficient power. The Confidence Beep stops when battery power is low.

You can activate the Confidence Beep only at startup.

1. To initiate the Confidence Beep press ⓘ and ◯ simultaneously.

After the self-test completes, the detector continuously beeps once every 5 seconds.

Note: *Normal one button startup and shutdown will not deactivate the Confidence Beep.*

You can deactivate the Confidence Beep only if the detector is turned off.

2. To deactivate the Confidence Beep press ⓘ and ◯ simultaneously.

The Confidence Beep will remain deactivated through future normal startups.

User Option Menu

User options are:

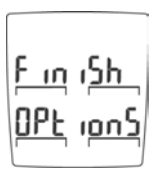
1. Finish options and exit User Options Menu.
2. Enable or disable latching alarms.
3. Enable or disable “SAFE” display mode.
4. Combustible sensor measuring selection: %LEL or % by volume. [% by volume for methane only.]
5. Enable or disable operation of one or more sensors.
6. Enable or disable Pass Code Protection.
7. Datalogger model only:
   Adjust real-time clock and calendar.
8. Datalogger model only:
   Adjust datalogger sampling rate from 1 to 127 seconds.

Note: *To change calibration due-date settings, see page 37.*

To access the User Options, press ▲ and ▼ simultaneously until the display reads:

To choose the desired options, press ▼ or ▲. Press ◯ to select the option.

To exit the options menu and return to normal operation at any time, press ◯ when the display reads:



Latched Alarms Function

The detector is shipped with the latching alarm function disabled. If the low and high gas alarms are set to latch, the audible and visual alarms persist in the event of an alarm condition until the alarm is acknowledged by pressing ◯.

To enable the latching alarm function, press ◯ when the display advises Latching Alarms.

The display will advise latching alarm function is **On** (activated).

Repeat above sequence to disable latched alarms. The display will advise the latching function is **OFF**.

"SAFE" Display Enable or Disable

When enabled, the Safe Display function advises that normal ambient conditions prevail and no gas hazard monitored exists. The word **SAFE** will scroll across the display when all gas levels are normal.

If any gas is present (readings other than zero for toxic gas or combustibles) and/or the oxygen reading is other than 20.9%, the display will show gas levels for all sensors. When levels return to normal the display will read **SAFE**.

To enable the Safe Display function, press ◯ when the screen reads **SAFE dISPLAY**.

The screen will then advise that the Safe Display function is activated.

Repeat the above sequence to disable the Safe Display function. The display will advise the Safe Display function is **OFF**.

Combustible Sensor Measuring Selection

The detector is shipped with the combustible sensor set to measure and display combustible gases in the 0 to 100% LEL (lower explosive limit) range.

The detector can be set to measure and display methane in the 0 to 5.0% by volume range.

Note: *Percent by volume measurements apply to methane only.*

To change the combustible sensor to measure shown, press ◯ when the display reads **LEL Sen Units**.

Press ▼ or ▲ to choose the desired units % LEL,

or choose % by volume methane. Confirm the desired units by pressing ◯.

Sensor Enable or Disable

⚠ Warning

Disabling an installed sensor configures the detector to a 1, 2, or 3-gas unit. No protection is now provided for the gas targeted by that sensor(s).

Disabling a sensor should be performed with extreme caution. In the event a sensor fails, Sensor Disable can be used to turn off the sensor fail alarm. The sensor should be replaced and enabled as soon as possible.

To disable a sensor, enter the User Options Menu (page 14).

Disabling/Enabling a Sensor

Select the sensor (H_2S, CO, LEL, or O_2) to be enabled or disabled. The detector will function normally with remaining enabled sensors. The sensor may be enabled again, at any time.

To disable (or enable) the H_2S sensor, press ◯ when the display advises:

The display then advises the H_2S sensor is **OFF**.

To enable H_2S sensor, repeat above sequence. The display advises H_2S sensor is **On**.

Repeat the sequence for CO, combustibles and O_2.

Pass Code Protection

The detector is shipped with the Pass Code Protection off. Pass Code Protection prevents the user access to the User Option Menu. The key icon is lit on a pass code protected unit.

User Options Menu (page 14): To activate the Pass Code Protect, press ◯ when the screen displays “PASS Lock.” The screen advises Pass Code Lock protection is **On** (activated) and beeps 2 times.

If the detector is pass code protected, the display advises the unit is locked and requests Pass Code. Enter correct code and press ◯ to confirm entry. Display advises Pass Lock is **OFF**.

Note: *Factory Code is provided separately.*

Pass Lock ON	Set Code	Pass Lock OFF

The correct 3-digit factory Pass Code must be entered within 10 seconds. Otherwise, the display advises **Not COrrEct** or **Error** and returns to the options menu.

No code entered or incorrect code entered and confirmed. • Beeps and flashes • Returns to previous screen	
Code entered but not confirmed. • Beeps and flashes • Display shows:	

Adjust Datalogger Sampling Rate

The detector is shipped with the datalogger set to record a sample every 5 seconds. The sample rate can be adjusted.

To adjust the datalogger sampling rate, press ◯ when the screen reads **LoggEr RAtE**.

The display will advise you to input a new sampling rate of once every 1 to 127seconds. To change the sampling rate, press ▼ or ▲ until the desired rate is displayed. Press ◯ to confirm the value.

Change the Date and Time

Time and date adjustments apply only to detectors equipped with a User Downloadable Datalogger.

1. Set the time and date to your local time.

To set the real-time clock calendar, press ◯ when the display advises **AdJust Clock**.

Display reads in order:
Minutes,
Hours (h),
Day of the week (*Monday =1*),
Date(D),
Month(M),
Year(Y).
Use ▼ and ▲ to adjust time and date. Press ◯ after each new setting.

Alarms

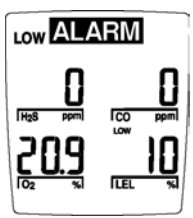
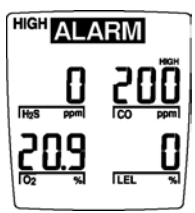
Table 6 describes the detector alarms and shows how the display looks for each alarm.

Table 7 describes the computed gas exposures.

During an alarm condition, the detector activates the backlight and the display shows the current ambient gas reading.

If more than one type or level of alarm exists at the same time, a multi-gas alarm will result.

Table 6. Alarms

Alarms	Display	Alarms	Display
Instant Low Alarm: • Slow modulating tone and flash • **ALARM** and target gas bar flash • **Vibrator Alarm** activates		• **Instant High Alarm:** • Fast modulating tone and flash • **ALARM** and target gas bar flash • **Vibrator Alarm** activates	

Latching Alarm User Option: *If the Low and High Latched Alarm function is activated, the audible and visual alarms continue to sound and flash until the alarm condition is acknowledged. Press ◯ to deactivate the audible and visual alarms when the current ambient gas reading falls below the Low Alarm level. The alarms cannot be deactivated if an alarm condition is still present. TWA and STEL alarm conditions will not reset without turning off the detector.*

Table 6. Alarms (cont.)

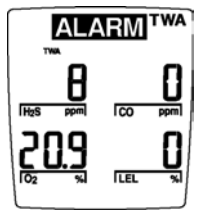
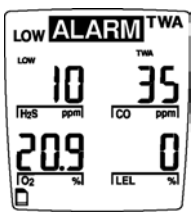
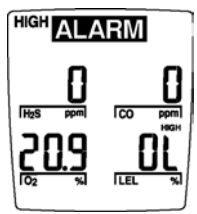
Alarms	Display	Alarms	Display
STEL Alarm: • Fast modulating tone and flash • **ALARM** and target gas bar flash • **Vibrator Alarm** activates		**TWA Alarm:** • Slow modulating tone and flash • **ALARM** and target gas bar flash • **Vibrator Alarm** activates	
Multi-Gas Alarm • Alternating Low and High Alarm tone and flash • **ALARM** and target gas bars flash • ***Note:*** *icon displayed advises the data card is present.* • **Vibrator Alarm** activates		**Over Range Alarm:** **(Over Level Exposure)** • Fast modulating tone and flash • **ALARM** and target gas bar flash • **Vibrator Alarm** activates	

Table 6. Alarms (cont.)

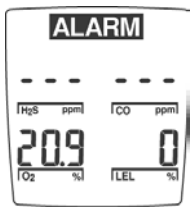
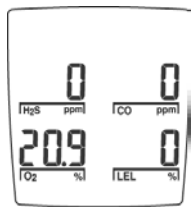
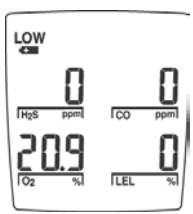
Alarms	Display	Alarms	Display
Sensor Alarm: • Slow modulating tone and flash • **ALARM** and gas bar(s) flash • **Vibrator Alarm** activates		**Confidence Beep:** • 2 fast beeps every 15 seconds.	
Low Battery Alarm: (Confidence Beep disabled) • 1 beep and 1 flash every 10 seconds • **LOW** flashes			

Table 6. Alarms (cont.)

Alarms	Display	Alarms	Display
Automatic Shutdown Alarm: • 8 beeps and flashes • **LOW** displays periodically • **Vibrator Alarm** activates		**Normal Shutdown:** • 4 beeps and flashes	

Gas Exposures Computed

⚠ Warning

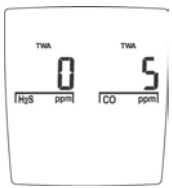
To avoid possible personal injury, do not turn off the detector during a work shift. The detector automatically resets the STEL, TWA and maximum gas exposures at startup. If you restart the detector during a work shift, these values will not reflect the entire work shift.

Table 7. Computed Gas Exposures

Gas Exposure	Description
TWA (CO and H_2S only)	Time-weighted average based on an 8-hour workday. Accumulated value.
STEL (CO and H_2S only)	Short-term exposure level based on a 15-minute period. Accumulated value.
Maximum* (Peak)	Maximum gas exposures encountered during work shift.
* Maximum gas exposure describes either very high levels or very low levels of oxygen	

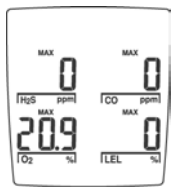
Viewing Gas Exposures

⇒ Press ◯ until the display shows the TWA gas exposures:



The display then shows the STEL gas exposures:

The display then shows the maximum gas exposures:



Press ◯ and ▲ to reset the maximum exposures.

Gas Alarm Setpoints

The detector's gas alarm setpoints trigger the gas alarms, which are described in Table 8.

Table 8. Gas Alarm Setpoints

Alarm	Condition
Low Alarm	*CO, H_2S, and combustibles:* Ambient gas level above Low Alarm setpoint. (For O_2, see next column.)
STEL and TWA Alarms (CO and H_2S only)	Accumulated value above the STEL or TWA alarm setpoints
High Alarm	*CO, H_2S, and combustibles:* Ambient gas level above High Alarm setpoint. (For O_2, see next column.)
Multi-Gas Alarm	Two or more gas alarm conditions

Oxygen Alarm Setpoints: User-selectable for Low and High Alarms. Set both below, or both above, or one above and one below 20.9%, as desired.

Resetting Gas Alarm Setpoints

Note: *Standard factory alarm setpoints will vary by region.*

Table 9. Sample Factory Set Alarm Setpoints

OSHA (Occupational Health and Safety Association) standard settings are used as an example.

Gas	TWA	STEL	Low	High
CO	35 ppm	50 ppm	35 ppm	200 ppm
H_2S	10 ppm	15 ppm	10 ppm	15 ppm
O_2	N/A	N/A	19.5%	23.5%
Combustible Gases	N/A	N/A	10% LEL	20% LEL

To change the factory-set alarm setpoints, refer to the section “Calibration and Setting Alarm Setpoints.”

You can disable an alarm by setting the alarm setpoint to 0.

Stopping a Gas Alarm

The Low and High Alarms stop when the ambient gas level returns to the acceptable range.

Note: *If alarms are set to latch, press ◯ to reset the audible and visual alarms.*

The detector computes the TWA value based on an 8-hour workday, and the STEL alarm based on a 15 minute period.

To clear the TWA, STEL and maximum gas exposure readings, press ◯ and ▲ simultaneously.

Sensor Alarm

The detector tests for a missing or defective sensor during the activation self-test. See the section “If the Detector Does Not Work.”

Low Battery Alarm

The detector tests the batteries on activation and continuously thereafter. If the battery voltage is low, the detector activates the Low Battery Alarm.

The Low Battery Alarm continues until you replace the batteries or the battery power is almost depleted. If the battery voltage drops too low, the detector executes an Automatic Shutdown.

Automatic Shutdown Alarm

If the battery voltage is in immediate danger of dropping below the minimum operating voltage, the audible alarm beeps 8 times and the visual alarm flashes 8 times. After 3 seconds, the display blanks out and the detector stops normal operation. The display shows **LOW** periodically until the battery power is depleted.

Replace the batteries. (See the section “Replacing the Batteries.”)

Note: *If the Confidence Beep is ON, the audible alarm does not beep during a Low Battery alarm. (See the section “Confidence Beep.”) Typically, the Low Battery Alarm continues for 30 minutes before Automatic Shutdown.*

Calibration and Setting Alarm Setpoints

Guidelines

Caution

The detector must be calibrated using the following gas concentrations: H_2S = 25 ppm, CO = 100 ppm, methane = 2.5% (50% LEL) and balance air.

If you do not calibrate all of the sensors, use the gas concentration listed above for the target sensor being calibrated.

When calibrating the detector, adhere to the following guidelines:

- CG-Q58 Calibration Gas (4-gas mix) is available from BW Technologies. (See the section “Replacement Parts and Accessories.”)
- Calibration accuracy is never better than the calibration gas accuracy. BW Technologies recommends a premium-grade calibration gas. Gases with NIST (National Institute of Standards and Technology) traceable accuracy will improve the validity of the calibration. Do not use a gas cylinder beyond its expiration date.
- Calibrate a new sensor before use. Allow the sensor to stabilize before starting calibration (used: 60 seconds; new: 5 minutes).
- Calibrate the detector on a regular basis, depending on use and sensor exposure to poisons and contaminants. BW recommends at least once every 180 days.
- Calibrate the detector if the ambient gas display varies at startup.
- It is best to calibrate the sensor before changing alarm setpoints.
- Calibrate only in a clean atmosphere that is free of background gas.
- To disable an alarm, set its alarm setpoint to 0.
- The combustible sensor is factory calibrated 0 to 100%
- LEL using methane. If monitoring a different combustible gas in the 0-100% LEL range, calibrate the sensor using the appropriate gas.
- The O_2 sensor is automatically calibrated each time on activation. Activate detector in a normal 20.9% O_2 atmosphere.
- If you require a certified calibration, contact BW Technologies using one of the numbers on page 2.

Diagnostics Protection

The detector tests the ambient air (Auto Zero) and the test gas applied (Auto Span) to ensure it meets expected values.

In Auto Zero, if any background target gas is present, the sensor(s) affected will read "Err" and exit the Auto Zero function, retaining the previous set value(s).

In Auto Span, if any target gas is not present or does not meet expected values, the display will advise you and exit calibration mode, retaining the previous set value(s).

Applying Gas to the Sensors

The calibration hose, which is shipped with the detector, simplifies sensor testing and calibration. Table 10 and Figure 3 show how to use it when applying gas to the sensors.

Table 10. Applying Gas to the Sensors

Item	Description
①	Detector and Calibration Cap
②	Calibration Hose
③	Regulator and Gas Cylinder

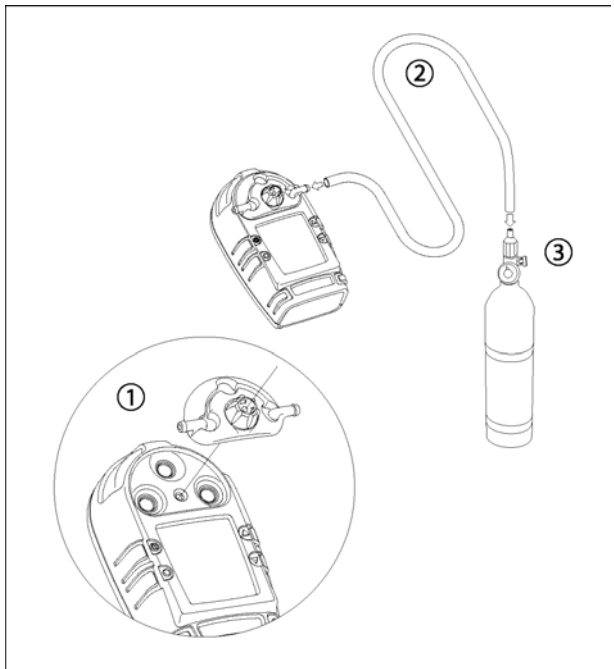


Figure 3. Applying Gas to the Sensors

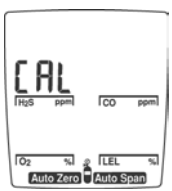
Calibration Procedure

To calibrate the detector and set its alarm setpoints, perform the following:

Start Calibration

To quit at any point after auto zero, press ⓘ. The detector retains any saved values, and the audible alarm beeps 4 times before the detector returns to normal operation.

1. Press ◯ and ▼ simultaneously. The detector beeps 4 times and the display shows:

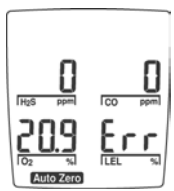


The audible alarm then beeps once.

Auto Zero and Oxygen Sensor Calibration

The display flashes “Auto Zero” while the detector automatically zeroes the H_2S, CO and combustibles sensors and calibrates the oxygen sensor.

The audible alarm then beeps twice.

Auto Zero	Sensor Fail
	

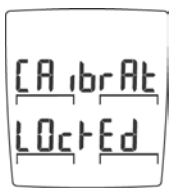
Note: *Do not apply the calibration gas until the display shows a flashing gas cylinder; otherwise, the auto zero step will fail.*

*If a sensor fails, the display advises error (***Err***) and skips the span for the failed sensor(s). Other sensors span normally. Press ⓘ to exit, then restart calibration in an atmosphere that is clear of the targeted gases. If the auto zero fails a second time, restart the detector to test the sensors.*

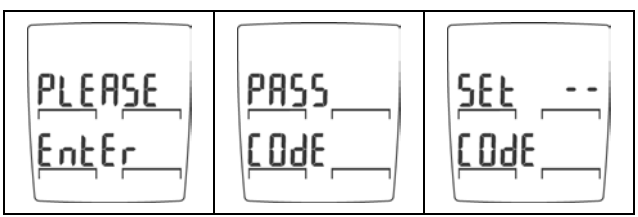
Pass Code Protect: If the detector is pass code protected, after a successful Auto Zero, the detector will ask for the pass code before proceeding to Auto Span and Alarm Setpoints.

Pass Code Protect Activated

Before setting span, the display will advise if the detector is pass code protected. The display will advise Calibration is locked.



Then display requests the Pass Code.



The Set up/down arrow icon lights to prompt entry of the 3 digit pass code. Enter the correct pass code using ▲ and ▼ keys. Press ◯ key to accept the displayed pass code.

If the correct code is entered, the detector automatically proceeds to Auto Span.

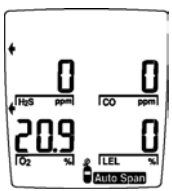
If the pass code is not entered within 10 seconds or the wrong pass code is entered, the detector advises the code is **Not COrrEct**.

The detector beeps 5 times and automatically returns to normal operation.

Auto Span

Calibrate one, two, three or four sensors as desired.

The display shows a flashing gas cylinder, prompting you to apply a calibration gas to the sensor or skip the span (sensitivity adjustment):



Use a calibration gas containing the gas concentrations listed in the Guidelines.

2. Install calibration cap and apply gas to the sensor at a flow rate of 250 to 500 ml/min. Or, press ◯ now to skip the span.

When the detector senses approximately one-half of the expected gas concentration (30 seconds), the audible alarm beeps once. The detector then begins spanning the sensor (2 minutes).

The audible alarm beeps 3 times at the end of the span.

Note: *The detector will not span a sensor if:*

- *You do not apply gas to the sensor.*
- *The sensor fails to detect at least one-half of the expected gas concentration in the first 30 seconds.*
- *The gas concentration drops below one-half of the expected gas level during the 2 minute span.*

If you apply gas to a sensor and the detector fails to span the sensor, repeat the calibration process using a new gas cylinder. If the sensor fails the span a second time, replace the sensor. (See the section "Replacing a Sensor or Sensor Filter.")

Alarm Setpoints

Alarms may be set anywhere within the detection range for the sensor (page 48), or set to zero for off.

Factory alarm setpoints may vary by region. An example is given below. Set as desired.

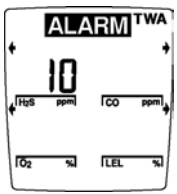
H_2S	TWA: 10 ppm STEL: 15 ppm LOW: 10 ppm HIGH: 15 ppm
CO	TWA: 35 ppm STEL: 50 ppm LOW: 35 ppm HIGH: 200 ppm
O_2	LOW: 19.5% HIGH: 23.5%
Combustible	LOW: 10% LEL HIGH: 20% LEL

Note: *If you do not press any pushbuttons within 10 seconds, the detector automatically retains the previous alarm setpoint.*

If you change an alarm setpoint but pause for 10 seconds before pressing ◯, the detector will reject the new value.

Setting the TWA Alarm Setpoint

The display shows the TWA alarm setpoint for H_2S.



The keypad arrow icons light, prompting you to input a new TWA Alarm setpoint. To accept the displayed value, press ◯.

3. To change the TWA Alarm setpoint for this sensor, press ▼ or ▲ until the display shows the new value. Press ◯ to save the displayed value.

Note: *If you do not press any pushbuttons within 10 seconds, the detector automatically retains the TWA Alarm setpoint.*

Setting the STEL Alarm Setpoint

The display shows the STEL Alarm setpoint for H_2S:

The keypad arrow icons light, prompting you to input a new STEL Alarm setpoint.

4. To change the STEL Alarm setpoint for this sensor, press ▼ or ▲ until the display shows the new value. Press ◯ to save the displayed value.

Setting the LOW Alarm Setpoint

Next, set the Low and High Alarm setpoints for each sensor in turn, starting with H_2S.

The display shows the Low Alarm setpoint for H_2S:

The keypad arrow icons will light, prompting you to input a new Low Alarm setpoint.

5. To change the Low Alarm setpoint for this sensor, press ▼ or ▲ until the display shows the new value. Press ◯ to save the displayed value.

Setting the HIGH Alarm Setpoint

The display shows the High Alarm Setpoint for H_2S:

The keypad arrow icons will light, prompting you to input a new High Alarm setpoint.

6. To change the High Alarm setpoint for this sensor, press ▼ or ▲ until the display shows the new value. Press ◯ to save the displayed value.

Setting the Remaining Alarm Setpoints

7. Repeat steps 3 through 6 to set alarm setpoints for CO, combustibles and O_2. The audible will beep 4 times when the alarm setpoint function is complete.

Setting the Calibration Due Date

After a successful calibration of one or more sensors, the display shows the number of days remaining before calibration is due.

The keypad arrow icons will light, prompting you to change the calibration due date of between 1 and 365 days if desired. The detector will beep five times and then return to normal operation.

If calibration is unsuccessful, the detector will advise: “Calibration due date cannot be reset.”

Verification (optional)

Test the detector using a gas cylinder other than the one used in the calibration steps. The gas concentration should not exceed the sensor's detection range. Confirm that the display shows the expected concentration.

Instrument Maintenance

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If the Detector Does Not Work 44
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Maintenance

To keep the detector in good operating condition, perform the following basic maintenance as required:

- Calibrate, test and inspect the detector at regular intervals.
- Keep an Operations Log of all maintenance, calibrations and alarm events.
- Clean the exterior with a soft damp cloth. Do not use solvents, soaps or polishes.
- Do not immerse the detector in liquids.

Replacing the Batteries

⚠ Warning

To avoid personal injury:

⇒ Replace the batteries as soon as the detector emits a Low Battery Alarm.

⇒ Use only batteries recommended by BW Technologies to prevent damage or personal injury.

⇒ Use only approved AA alkaline or charged AA NiMH batteries, properly installed in the detector case. See page 49 for approved batteries.

⇒ Charge batteries using only a recommended charger. Do not use any other charger. Failure to observe this precaution could lead to fire or explosion.

⇒ Do not change or charge batteries in a hazardous location. Doing so will impair the intrinsic safety of the unit, and may lead to fire or explosion.

Table 11 and Figure 4 illustrate how to replace the batteries. If the detector is on, turn off the detector before replacing the batteries. Press the two release buttons on the detector. The battery tray pulls out and snaps in.

Remove the batteries from the battery drawer and replace according to the polarity markings. Close drawer until you hear both sides click, which locks the battery drawer in place.

Table 11. Replacing the Batteries

Item	Description
①	Detector Front
②	Release Buttons
③	Batteries

To preserve battery life, turn off the detector when you are not using it.

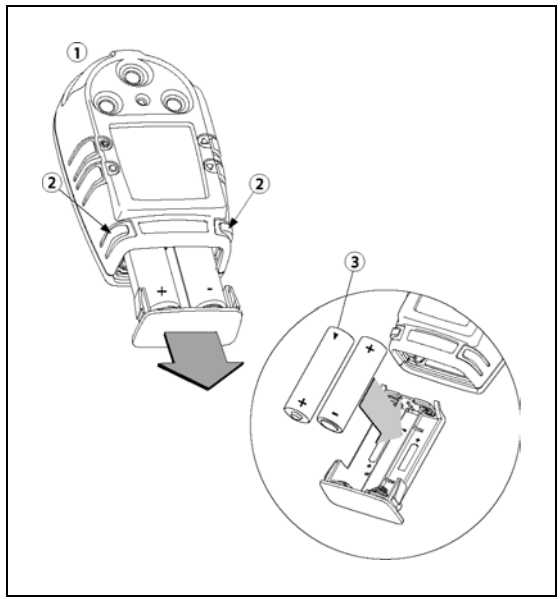

Figure 4. Replacing the Batteries

Replacing a Sensor or Sensor Filter

⚠ Warning

To avoid personal injury, use only sensors specifically designed for the detector. See the section "Replacement Parts and Accessories."

Each sensor has a high degree of resistance to common vapors and gases. A sensor will most likely clear itself if you remove the detector to a clean environment and wait 10 to 30 minutes. Do not expose a sensor to the vapors of inorganic solvents (such as paint fumes) or organic solvents. The section "If the Detector Does Not Work" describes problems caused by a sensor in need of calibration or replacement.

Gently rocking the sensor back and forth may help free a tightly held sensor. Insert new sensor on the PCB, ensuring that sensor posts are aligned correctly. Two-gas units require a dummy sensor.

Calibrate the detector after changing any sensor.

Table 12. Replacing a Sensor or Sensor Filter

Item	Description
①	Detector Screws
②	Sensors
③	Sensor Filter

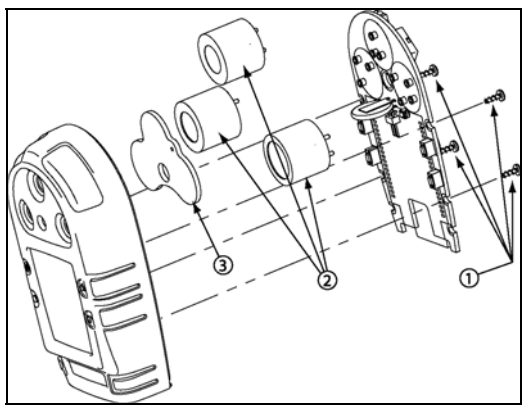

Figure 5. Replacing a Sensor or Sensor Filter

Installing the MultiMediaCard (MMC)

Figure 6 illustrates how to install the MMC. If the detector is on, turn off the detector. Remove the battery drawer (see Figure 4). Slide the MMC face down into the MMC port and replace the battery holder.

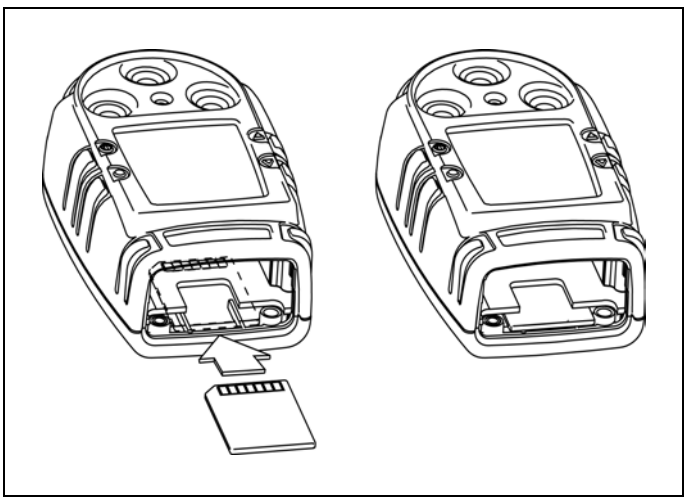

Figure 6. Installing the MultiMediaCard (MMC)

If the Detector Does Not Work

The detector's electronics are protected from variations in humidity and corrosive atmospheres. If you encounter a problem, try the solutions listed in Table 13.

If you still are unable to correct the problem, contact BW Technologies using one of the numbers on page 2.

Table 13. Troubleshooting Tips

Problem	Possible Cause	Solution
Detector does not turn on.	No batteries. Depleted batteries. Damaged or defective detector.	→ Install batteries. → Replace batteries. → Contact BW. (See page 2.)
Detector enters alarm immediately when turned on.	Sensor needs to stabilize. Low Battery Alarm. Sensor Alarm.	→ Used sensor: wait 60 secondsNew sensor: wait 5 minutes → Replace batteries. → Replace sensor.
Activation self-test fails during one of the first five steps.	General fault.	→ Contact BW. (See page 2.)

Table 13. Troubleshooting Tips (cont.)

Problem	Possible Cause	Solution
Detector does not display normal ambient gas reading after activation self-test.	Sensor not stabilized.	→ Used sensor: wait 60 seconds New sensor: wait 5 minutes
	Detector requires calibration.	→ Calibrate detector.
	Target gas is present.	→ Detector is operating properly. Use caution in suspect areas.
Detector does not respond to pushbuttons.	Batteries are depleted.	→ Replace batteries.
	Detector is performing operations that do not require user input.	→ Pushbutton operation restored automatically when the operation ends
Detector does not accurately measure gas.	Detector requires calibration.	→ Calibrate sensor.
	Detector is colder/hotter than ambient gas.	→ Allow detector to acquire ambient temperature before use.
	Sensor screen is blocked.	→ Clean sensor screen

Table 13. Troubleshooting Tips (cont.)

Problem	Possible Cause	Solution
Detector does not enter alarm.	Alarm setpoint(s) are set incorrectly. Alarm setpoint(s) set to zero. Detector is in calibration mode.	→ Reset alarm setpoints. → Reset alarm setpoints. → Complete the calibration procedure.
Detector intermittently enters alarm without apparent reason.	Ambient gas levels are near alarm setpoint or the sensor is exposed to a puff of the target gas. Alarms set incorrectly. Missing or faulty sensor.	→ Detector is operating normally. Use caution in suspect areas. Check maximum gas exposure reading. → Reset alarm setpoints. → Replace sensor
Detector automatically shuts off.	Automatic Shutdown feature activated due to weak batteries.	→ Replace batteries

Replacement Parts and Accessories

⚠ Warning

To avoid personal injury or damage to the detector, use only the specified replacement parts.

To order parts or accessories listed in Table 14, contact BW Technologies. (See page 2.)

Table 14. Replacement Parts and Accessories

Model No.	Description	Qty
D4-RW90	Replacement combustible sensor	1
SR-X10	Replacement O_2 (2-year) sensor	1
D4-RHM04	Replacement Twin Tox H_2S/CO sensor	1
PS-RH04S (3-gas units)	Replacement H_2S sensor	1
E2339 (2-gas units)	Dummy sensor	1
CG-Q58	Quad calibration gas (58 L)	1
CG-Q34	Quad calibration gas (34 L)	1
CG-T34	Dual calibration gas for 2-gas units (34 L)	1
CG-BUMP1	Bump test gas	1
REG-0.5	Regulator (0.5 L/min)	1
MMC32	32 MB MultiMediaCard	1
MMC64	64 MB MultiMediaCard	1
GAMIC-V-CHRG	12V vehicle charger and 4 AA NiMH batteries	1
GAMIC-C01-K	110 VAC 4-port charger and 4 AA NiMH batteries	1
GAMIC-C01-K-(xx)	230 VAC 4-port charger* and 4 AA NiMH batteries	1

**Add suffix (-UK) for United Kingdom mains plug, (-EU) for European mains plug, (-AU) for Australian mains plug.*

Specifications

Instrument Dimensions: 6 x 10 x 3.3 cm (2.4 x 4.0 x 1.3 in.)

Weight: 211 g (7.4 oz.)

Operating Temperature: -20 °C to +50 °C (-4 to +122 ºF)

Storage Temperature: -20 °C to +50 °C (-4 to +122 ºF)

Operating Humidity: 5% to 95% relative humidity (non-condensing)

Operating Pressure: 95 to 110 kPa (Combustibles)
95 to 110 kPa (O_2)
95 to 110 kPa (Toxics CO, H_2S)

Alarm Setpoints: May vary by region and are user-settable.

Detection Range:
CO: 0-500 ppm in 1 ppm increments
H_2S: 0-100 ppm in 1 ppm increments
O_2: 0-30% in 0.1% increments
Combustibles: field settable for:
0-100% LEL in 1% LEL increments or
0-5.0% v/v methane

Sensor Type:
H_2S/CO: Twin plug-in electrochemical cell
O_2: Plug-in electrochemical cell
Combustibles: Plug-in catalytic bead

O_2 Measuring Principle: Capillary controlled concentration sensor

Alarm Conditions: TWA Alarm, STEL Alarm, Low Alarm, High Alarm, Multi-Gas Alarm, Sensor Alarm, Low Battery Alarm, Confidence Beep, Automatic Shutdown Alarm

Audible Alarm: 95 dB at 1 ft (0.3 m) variable pulsed dual beepers

Visual Alarm: Dual red light-emitting diodes (LED)

Display: Alphanumeric liquid crystal display (LCD)

Backlight: Automatically activates whenever there is insufficient light to view the display and during alarm conditions

Self-test: Initiated at activation

Calibration: Automatic Zero and Automatic Span

Oxygen Sensor: Automatic Span on activation

User Field Options: Confidence Beep, Latching Low and High Alarms, Pass code protection, enable/display "SAFE" display mode Combustible sensor measurement (0-100% LEL or 0-5.0% v/v methane, Sensor Disable, set calibration due date, TWA and STEL.
Datalogger models only Adjust clock calendar and Set sampling rate.

Battery Operating Time:
2 Alkaline cells: 16 -18 hours
2 Rechargeable NiMH cells: 14-16 hours (Quest Platinum HG1600AACS)

Approved Batteries:

Alkaline:
Duracell MN1500
Energizer E91

NiMH rechargeable:
Quest Platinum HGAAC1800G
Quest HG1600AACS
Energizer NH15
Maha Powerex 1700 mAh MH-AA170
Maha Powerex 1800 mAh MH-AA180
Yuasa Delta 1300 mAh DHA1400AA
Yuasa Delta 1500 mAh DHA1600AAC
Uniross 1300 mAh (Only to be used in North American regions)
Uniross 1700 mAh (Only to be used in North American regions)

Battery Charger (optional): Quest™ Q2 4-port rapid NiMH battery charger with country-specific mains adapter

First-time Charge: 1-4 hours per battery

Normal Charge: 1 hour per battery

Approvals:

Approved by CSA to both U.S. and Canadian Standards.

Approved: Class I, Division 1, Group A, B, C, and D; Class I, Zone 0, Group IIC

Standards:

CAN/CSA C22.2 No. 157 and C22.2 152 ANSI/UL – 913 and ANSI/ISA –S12.13 Part 1

Temperature Code: Alkaline: 163°C
NiMH: 212°C
Ambient -20°C =Ta = +50°C

CE (LCIE): EEx ia d IIC ATEX Ⓔx II 2 G

ATEX: 03 ATEX 6091X

General Specifications for Datalogger Units

Media Type: MMC (MultiMediaCard)

Size: 32 MB (standard); 64 and 128 MB cards available

Storage: 500,000 lines of data available; 4.4 months at 5 second intervals (based on a normal workweek)

Memory Type: Wrap-around memory ensures most recent data is always saved

Sample Rate: One reading every 5 seconds (standard)

Data Recorded: All sensor readings, all alarm conditions, calibrations, event flags, battery status, sensor status, confidence beep activation, and detector status along with the time and date for each reading and unit serial number

MMC Card Test: Automatically on activation

GasAlertMicro with User Downloadable Datalogger

Operation: Requires no user intervention (automatic)

Indicators: Icon advises Datalogger is operating normally, MMC card missing/malfunction advise

Compatible with: Desktop PC Computer or Laptop

Operating System: Windows 95 or higher; Macintosh OS 8.6 or higher

Download via: MMC card reader

Software Required: Spreadsheet or database compatible with comma-separated-value (CSV) text files (Excel, Access, Quattro, etc.)

Card Alarm: MMC Card Fail or Missing

Support:
BW E.D.M (Excel Datalog Manager): E.D.M. is an Excel software add-in that enhances the abilities of Microsoft® Excel when handling GasAlertMicro User Downloadable Datalogger data files.

Appendix A

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Excel Datalog Manager (E.D.M.)

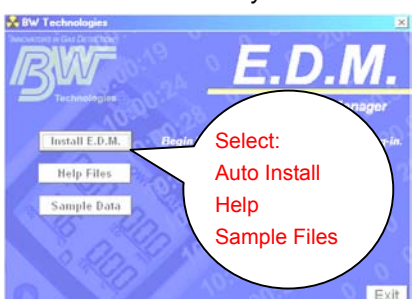
The Support CD for the User Downloadable Datalogger Detectors contains:

- BW Technologies' Excel Datalog Manager (E.D.M.) software plug-in.
- Installation and Use instructions
- Datalogger example data files and spreadsheets.

IMPORTANT

E.D.M. *Review and use the CD Help and Sample files for installing and using the E.D.M. program.*

Excel: *All functions and features of Microsoft® Excel are available, including automatic graphing. Use Excel Help to sort, format and archive data easily and automatically.*



Excel Datalog Manager (E.D.M.) Software Plug-in

Data import is fully automated and allows Excel to load files larger than 65,535 lines. The E.D.M. program will automatically create additional worksheets for larger files.

System Requirements

Recommended E.D.M. system: *750 MHz Pentium (or equivalent), 100 MB hard disk space, Microsoft® Windows 2000, Microsoft® Excel 2000*

Minimum E.D.M. system requirements: *300 MHz Pentium (or equivalent), 30 MB free hard disk space, Windows 95, Microsoft® Excel 95*

Sample Data Files

Sample data are available on CD. Sample data files help you become familiar with the software.

Files with the .CSV extension are samples of actual data files downloaded from a detector. CSV files may be imported into Excel using the E.D.M. wizard or loaded directly into Excel or a compatible database, spreadsheet or word processor.

Installing Excel Datalog Manager (E.D.M.):

- Place the Datalogger E.D.M. Support CD in the middle of the CD-ROM tray and close.

- **AutoPlay:** From the main window, click on the “Install E.D.M.” button, the installation wizard will guide you.
- **AutoPlay not Activated:** In "My Computer," find the E.D.M. icon on your CD drive.

Double click the E.D.M. icon to select the drive.
Then, double click the folder “EDM v###” to open.
Next, double click the “Setup” file.
Now the installation wizard will guide you.

After setup is complete and you have restarted your computer, you will find a new item, called **BW Technologies**, listed in your start menu. This item contains:

- E.D.M. Help – (Use instructions & Help information)
- Excel Datalog Manager (Starts the Excel Datalog Manager software)

MMC Card Reader Installation

To retrieve recorded data, a MultiMediaCard reader has to be configured and installed to your computer. The adapter provides the physical connection between the MultiMediaCard and your computer. Follow manufacturer’s instructions.

Ensure your card reader is compatible with your computer. Several card readers that support Windows are available from BW Technologies.

Types of MultiMediaCard Readers

MultiMediaCard readers are available in 2 types:

- Universal Serial Bus (USB); or
- PCMCIA (PC card) adapters.

Start Excel Datalog Manager

Double click on the E.D.M. icon on the desktop to start the Excel Datalog Manager Wizard. This provides a simple method of transferring data from the datalogger system to Microsoft® Excel.

Import Your Data File.

After starting the E.D.M. wizard, follow the easy steps:

1. Start: The first screen asks you to click "'**Next**"' to begin the data file import.

2. File Location: Click "'**Browse**"' to locate your data file. Once located, highlight the file and cClick "'**Open'**," then "'**Next**"' to move to the next option.

Data files may be imported from the hard disk, or directly from the MultiMediaCard containing the data. The import process does not modify or erase the original data.

3. Archive Back-up of Data File:

This option enables you to create a complete backup copy of the original card data. Click the "**'Browse**"' button to select the location to place the backup data file. *Once finished, click* "'**Next**."

Back-ups can be loaded into Excel or other compatible programs at any time.

4. Location of Final File: Use this step to select the location of the finished Excel data workbook. The data file will be sorted, imported into Excel, formatted, and saved as an Excel workbook file. *Once finished, click* "**Next**."

5. Filter: This step allows the user to filter the original files down to a convenient, manageable size without losing any critical information.

Select all logged data, or select to include only every second, third, etc., entry without losing any critical information. *Once finished, click* "**Next**".

Note: *This option does not remove or delete data from the original data file or any archived file; only the final Excel workbook is affected. ALL Records involving alarm conditions, failures, calibrations, battery warnings or other important events will not be filtered and will appear in the final Excel Workbook in their entirety. If the confidence beep is used on the datalogging instrument, this step has no effect; E.D.M. will not filter out records where the confidence beep is active.*

6. Finish: Click "**Finish**" to import the data into Excel and **open the finished Excel data workbook.**

Note: *The data file may take several minutes to transfer, read and sort in E.D.M.*

Direct Import to Compatible Programs

Information from this point on applies only to users who are not using the E.D.M. plug-in. The following information applies to direct data import into Excel and other compatible programs. To use the datalogger data, insert the data card into a computer adapter and open the data file LOGFILE0.CSV using spreadsheet or database software. Word processors and text editors may also be used, but performance may be poor, since the datalogger file is at least 16 megabytes in size.

Data for user-accessible models is comma-separated-values (CSV) format. The data order is:

- Date, day, time
- H_2S, CO, Combustibles, O_2
- H_2S TWA, CO TWA
- Status codes, serial number

Recorded data includes eight single-character unit status codes. The eight characters represent codes for the H_2S, CO, combustibles, and O_2 sensors, datalogger, unit battery status, and unit alarm status. A summary of most of the available codes can be seen in table A.

Importing the Data File Into Compatible Desktop Applications

Information from this point forward only applies to users who are not using the Excel Datalog Manager (E.D.M.) plug-in.

The recorded data can be loaded into most spreadsheet, database, word processor, or text editor applications, some examples are:

- Microsoft® Excel 95, 98 and 2000;
- Quattro Pro;
- Lotus 1-2-3;
- Microsoft® Access; and
- Microsoft® Word

Determining Application Compatibility

To determine if the application selected is compatible:

- Insert MMC card in to the Card Reader; then
- Open desired application.
- Use the applications "**File/Open** " menu options to locate and open the data file.

If the recorded data file is compatible with the application, it will open. If not the application will report an error in opening the file.

Important

Some applications have an internal file size limits, and may not load the entire file. Check the application's specifications prior to use.

Table A: DATALOGGER STATUS CODES

Codes	Explanation
General Codes	
—	Normal operation
G	Backlight is on
Sensor Codes	
L	Low Alarm
H	High Alarm
T	TWA Alarm
U	Dual alarm (Low and TWA alarms)
V	Dual alarm (High and TWA alarms)
s	N/A STEL alarm
u	Dual alarm (Low and STEL) alarms)
v	Dual alarm (High and STEL) alarms)
w	Dual alarm (TWA and STEL) alarms)
x	Triple alarm (TWA, STEL and Low)
y	Triple alarm (TWA, STEL and High)
O	Sensor is over-ranged
C	Calibrating
F	Sensor Failure
1	Alarm setpoint 1 (Low alarm)
2	Alarm setpoint 2 (High alarm)
3	Alarm setpoint 3 (TWA alarm)
4	Alarm setpoint 4 (STEL alarm)
D	Calibration due date (in days)
Battery Status Codes	
—	Batteries OK
B	Low battery alarm
K	Confidence beep is active
Alarm Status Codes	
L	Low Alarm
H	High Alarm
T	TWA Alarm
M	Multi-gas Alarm
C	Calibration
Q	Manual Shutdown
S	Automatic Shutdown
F	Self-test Fail
R	Real-time Clock Failure

Note: *TWA readings greater than 99 are recorded as OL.*

When datalogger information is imported into most spreadsheet software, it will appear similar to the example below; line numbers are included here for clarity.

Note: *Some compatible software packages have an internal file size limit of and may not load the entire file. Check your software limit.*

Line	Date (dd-mm-yy)	Day (Mon=1)	Time (hh:mm:ss)	H_2S (ppm)	CO (ppm)	LEL (%LEL)	O_2 (%)	H_2S TWA (ppm)	CO TWA (ppm)	Unit Status	Serial Number
1	17-07-02	#3	9:54:25	10	35	--	--	--	--	33------	S102-002350
2	17-07-02	#3	9:54:30	15	50	--	--	--	--	44------	S102-002350
3	17-07-02	#3	9:54:35	10	35	10	19.5	--	--	1111----	S102-002350
4	17-07-02	#3	9:54:40	15	200	20	23.5	--	--	2222----	S102-002350
5	17-07-02	#3	9:54:45	--	101	--	--	--	--	DDDD---D	S102-002350
6	17-07-02	#3	9:54:50	0	0	0	20.9	0	0	--------	S102-002350
7	17-07-02	#3	9:54:55	2	7	14	20.2	0	0	--L----L	S102-002350
8	17-07-02	#3	9:55:00	11	37	34	20.2	0	0	LLH----M	S102-002350
9	17-07-02	#3	9:55:05	13	47	35	20.3	0	0	LLH----M	S102-002350
10	17-07-02	#3	9:55:10	13	59	13	20.3	0	0	LLL----M	S102-002350
11	17-07-02	#3	9:55:15	8	39	0	20.3	0	0	-L-----L	S102-002350
12	17-07-02	#3	9:55:20	2	7	0	20.3	0	0	--------	S102-002350
13	17-07-02	#3	9:55:25	0	0	0	20.9	0	0	------B-	S102-002350
14	17-07-02	#3	9:55:30	0	0	0	20.9	0	0	------B-	S101-002350

In this example:

Line 1 shows the TWA alarm setpoints (code '3') for H_2S and CO.

Line 2 shows the STEL alarm setpoints (code '4') for H_2S and CO.

Line 3 shows the low alarm setpoints (code '1') for all sensors.

Line 4 shows the high alarm setpoints (code '2') for all sensors. Alarm points are only recorded when the unit is turned on, indicating the unit has just been activated.

Line 5 shows the number of days remaining before calibration is due.

Line 6 shows normal operation. There are no gas alarms.

Line 7 shows a combustible gas alarm. H_2S and CO gases are present below alarm levels. Oxygen is less than 20.9% but within acceptable range. The unit is in low alarm.

Lines 8 and 9 show H_2S and CO in low alarm, and combustibles (0-100% LEL) in high alarm. Oxygen is less than 20.9% but within acceptable range. The unit is in multi-gas alarm.

Line 10 shows H_2S, CO and combustibles (0-100% LEL) in low alarm. Oxygen is less than 20.9% but within acceptable range. The unit is in multi-gas alarm.

Line 11 shows CO in low alarm. Oxygen is less than 20.9% but within acceptable range. H_2S is present below alarm levels. The unit is in low alarm.

Line 12 shows H_2S and CO present below alarm levels. Oxygen is less than 20.9% but within acceptable range. There are no gas alarms.

Lines 13 and 14 show the unit emitting a low battery alarm. There are no gas alarms.

MultiMediaCard Compatibility

A standard 32MB MMC Flash Memory card is supplied with the datalogger. When purchasing additional MultiMediaCards, BW Technologies recommends MMC Flash Memory cards that contain between 32 MB and 128 MB storage capacity.

MultiMediaCard(s) compatible with the “MMC“ specification will always have the exact word “MultiMediaCard“ or “MMC“ written on the disk or package. Cards that do not contain these exact words are not a MultiMediaCard.

The “MMC“ is ***not*** the same as the following:

- MultiMedia card;
- Multi media card;
- SmartMedia
- CompactFlash
- Memory Stick

MMC cards are available through retailers throughout the world. They are also available through mail order and Internet vendors.

Troubleshooting

A new MMC Card is automatically formatted when it is installed in the detector. When installing any new or blank MMC card into the datalogger, detector LCD will display "CARD IS BLANK"," then the datalogger will proceed to auto-format the MMC card.

Recovering Data Files

If the MMC card is reformatted or erased accidentally by your computer application, the recorded data file can be recovered.

FIRST: First ensure the card is installed properly in the card reader. If the recorded data file is not visible ensure that:

The card reader is visible in the **My Computer** window.

- If not, verify that the card reader is installed correctly and that the connections are secure.
- In the "Removable Disk" drive window, ensure All Files is selected in the File Types field.
- "Reformat and Recover Deleted Files"

Place the MMC card back into the detector. The detector will reformat. The file should now be available.

If the Recorded Data File (Logfile.csv), is still not visible:

- Format MMC card in Windows.
- Remove MMC card from the card reader.
- Insert MMC card back into the GasAlertMicro datalogger.
- Allow datalogger to reformat the MMC card.
- Remove MMC card from datalogger.
- Insert MMC card back into card reader.
- Select My Computer icon.
- Select the drive that corresponds to the card reader.
- The Recorded Data File (Logfile.csv), will now be visible.

If the Recorded Data File is still not visible, insert the MMC into the detector and turn on the instrument. The screen will advise: "Error. Data file has been deleted." You will then be given the choice of erasing or restoring the data. Use ▲ or ▼ to scroll through the options. Press ◯ to confirm your choice.

To restore the data, select "Restore." The instrument will then restore the data to the MMC, and the detector will resume the start-up procedure.

To permanently erase the data on the MMC, select “Erase.” The display will then read, “Are you sure?”

Press tab (◯) to confirm your choice or ⓘ to abort. If you choose to abort the erasing procedure, the display will read, “Erase aborted.”

If the MMC is full, the display will then read “Note: Card cannot be used.” Insert a new card or erase the data. Once you confirm your decision to erase the data on the MMC, the data will be permanently erased from the MMC, and the detector will resume normal operation.

D2067/1 English
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